

WHAT IS CLAIMED IS:

- 1 1. A transducer positioning apparatus comprising:
2 a frame;
3 a flexible member attached to the frame;
4 a guide member suspended from the frame by the flexible member;
5 a carriage that is movable with respect to the guide member between
6 multiple positions relative to the guide member;
7 a transducer mounted on the carriage; and
8 an actuator associated with the carriage, the actuator being operative
9 to move the carriage with respect to the guide member to a selected position of the
10 multiple positions and to move the carriage and the guide member relative to the
11 frame to locate the transducer in a desired position;
12 wherein the flexible member is configured to allow axial movement
13 of the guide member while inhibiting rotational movement of the guide member.
- 1 2. The apparatus of claim 1 wherein the flexible member has first
2 and second ends that are each attached to the frame.
- 1 3. The apparatus of claim 1 further comprising an additional flexible
2 member, wherein each flexible member has first and second opposite ends that are
3 each attached to the frame, and wherein the guide member is disposed between the
4 flexible members.
- 1 4. The apparatus of claim 3 wherein each flexible member comprises
2 a leaf spring.
- 1 5. The apparatus of claim 1 wherein the guide member includes an
2 elongated guide body, and the carriage is movable along the guide member between
3 the multiple positions.

1 6. The apparatus of claim 1 further comprising an anti-rotation
2 member associated with the carriage for inhibiting rotational movement of the
3 carriage as the carriage moves with respect to the guide member.

1 7. The apparatus of claim 6 wherein the guide member is positioned
2 between the transducer and the anti-rotation member.

1 8. The apparatus of claim 6 wherein the anti-rotation member is
2 fixed to the carriage.

1 9. The apparatus of claim 1 wherein the carriage includes first and
2 second guide elements that are movable along an axis of the guide member, and
3 wherein a plane bisecting the transducer extends between the guide elements and
4 generally perpendicular to the axis.

1 10. A transducer positioning apparatus comprising:
2 a fixed frame;
3 first and second spring members that each have first and second ends
4 attached to the fixed frame;
5 a first carriage suspended from the fixed frame by the spring
6 members, the first carriage including an elongated main guide member and a first
7 anti-rotation member;
8 a second carriage movably associated with the first carriage such that
9 the second carriage is movable along the main guide member between multiple
10 positions relative to the main guide member, the second carriage including a second
11 anti-rotation member that cooperates with the first anti-rotation member to inhibit
12 rotation of the second carriage as the second carriage moves along the main guide
13 member;
14 a transducer mounted on the second carriage; and
15 an actuator associated with the second carriage, the actuator being
16 operative to move the second carriage along the main guide member to a selected
17 position of the multiple positions and to move the first carriage and the second

18 carriage relative to the fixed frame when the second carriage is in the selected
19 position relative to the main guide member;
20 wherein the spring members are configured to allow axial movement
21 of the first carriage while inhibiting rotational movement of the first carriage.

1 11. The apparatus of claim 10 wherein the second carriage includes
2 first and second bearings that are movable along an axis of the main guide member,
3 and wherein a plane bisecting the transducer extends between the bearings and
4 generally perpendicular to the axis.

1 12. The apparatus of claim 11 wherein the main guide member is
2 positioned between the transducer and the anti-rotation member.

1 13. The apparatus of claim 12 wherein the actuator includes an
2 actuator portion attached to the second carriage, and wherein the first carriage,
3 second carriage and actuator portion cooperate to at least partially define a
4 suspended mass having a center of mass that is generally axially aligned with the
5 guide member.